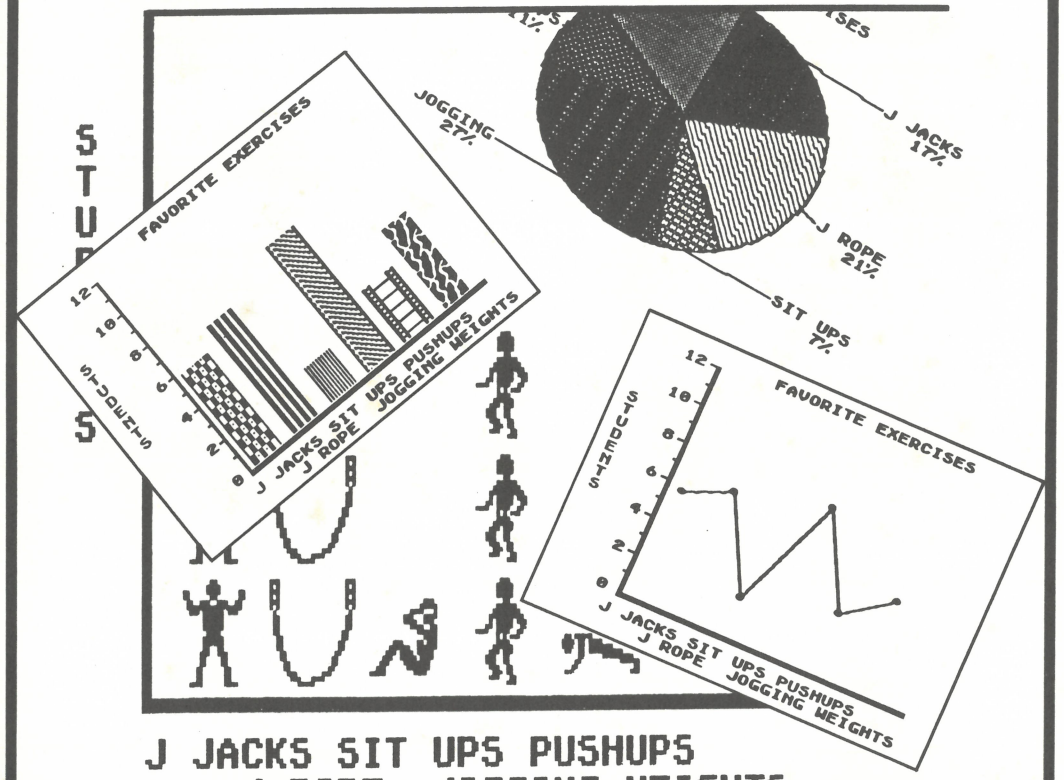
Super SCIENCE

GRAPHS AND CHARTS:
HEALTH AND HUMAN BODY



J JACKS SIT UPS PUSHUPS
J ROPE JOGGING WEIGHTS

SCHOLASTIC

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CONTENTS

Introduction

From the Editor 4
Using the Software with *SuperScience* Magazine 5
Equipment Needed 8
Making a Legal Copy of the *SuperScience Graphs and Charts* Disk 8
Special Equipment Information 10
How to Load *SuperScience Graphs and Charts* 11

How to Use *SuperScience Graphs and Charts*

The MAIN MENU 13
The UTILITY MENU 14
MAKE A GRAPH OR CHART MENU 15
The WHAT DO YOU WANT TO DO NOW MENU 23

Activities

Laterality —The Science of Left and Right 25
Keeping Our Balance 34
Heart Rate and Exercise 40

How Fit Is Your Class?: The Science of Health and Performance

Exercises 47

Appendix (APPLE) 52

Pictograms 54

INTRODUCTION

From the Editor

Dear Teacher,

We developed *SuperScience Graphs and Charts: Health and Human Body* with a single goal in mind: To provide you with a classroom tool that makes teaching "hands-on, minds-on" science easier and more, well, *comfortable.*

That same goal has already spawned a school of other teacher-friendly *SuperScience* products, including two classroom magazines with teaching guides (the Red Edition for grades 1-3 and the Blue Edition for grades 4-6) and monthly wallcharts. All *SuperScience* products are supported and funded in part by the National Science Foundation.

What is "hands-on, minds-on" science all about? It's science that asks kids to *do* and to *think.* It's science that teaches important science *processes*—classifying, observing, gathering data, experimenting. And it's science that builds critical thinking skills. Here's how *SuperScience Graphs and Charts* fills the bill:

- **Observing:** How do your muscles feel when they get tired?
- **Classifying and Comparing:** Which exercises require strength? Endurance? Flexibility?
- **Measuring:** How many times per minute can you feel your pulse beat?
- **Gathering Data:** Students graph the number of right and left-handers in their class or school and interpret the results.
- **Predicting and Inferring:** "If most people are right-handed, then I predict that most will be right-footed, too."
- **Experimenting:** Investigating balance and vision by conducting a series of tests.
- **Communicating:** Sharing and comparing charts and graphs with other students.

Our focus on process skills doesn't mean that we've overlooked science content. The following activities fit neatly into any elementary science unit on "Health and Human Body." Topics include right-left preferences, balance and vision, the circulatory system, and exercise and fitness.

Each topic begins with a simple activity to get kids started—complete with a learning objective, a list of materials, background information, step-by-step directions, and "wrap-up" discussion questions. Ready to take the activity further? Look for the section marked "Further Explorations." You'll find extension activities that build on the skills, processes, and content learned in the basic activity.

It's our hope that these activities are just the beginning. We're sure you'll find endless opportunities for *SuperScience Graphs and Charts* to turn science learning into science exploring.

Sincerely yours,

P.S. You'll find ideas for using *SuperScience Graphs and Charts* with recent issues of *SuperScience* magazine in the next section, below.

Using the Software with *SuperScience* Magazine

As an all-purpose graphing tool, *SuperScience Graphs and Charts* can extend or enhance many of the activities in *SuperScience* Blue Edition. Here are a few ideas for recent issues. Look for additional opportunities in issues to come!

SEPTEMBER 1989

Page 4: "The Blinking Code"
How many times do *you* blink in a minute? Students can design their own experiments to "crack" the blinking code, and then make a bar graph of the results.

Page 7: "A Fall Eggs-periment"
Why do some eggs stand on end and others don't? Experiment with weight (small, medium, large), temperature of the eggs, shape, and other variables. Then make a line graph showing how long (if at all) the various eggs stand on end.

Page 24: "Speed Limit: Light"
In the last 100 years, advancements in technology have allowed us to travel faster and faster. Students can compare speeds by making a bar graph of the fastest trains, planes, automobiles, and spacecraft.

Page 28: "How Many Moons?"
Why do some planets have lots of moons, and others none? Have students construct a series of bar graphs that compare the sizes of the planets, their distance from the sun, and their number of moons.

OCTOBER 1989

Page 4: "Read It and Yawn!"
How contagious is yawning? One student unleashes a yawn among a group of unsuspecting classmates. How many yawn back? Have students make pie charts of yawners and non-yawners for each class in your school.

Page 6: "Warning: This TV Ad Contains Sugar"
How much sugar is in *your* cereal? Make a class bar graph showing the sugar content of each child's favorite cereal. (Most cereal boxes list the amount of sugar in grams per serving.)

Page 20: "Bobbing for Saturn"
Make bar graphs to compare the weights, sizes, and densities of various objects. You'll find densities listed in geology books and the encyclopedia (look under the substance's name). Advanced students can calculate density on their own, using the formula Density = Mass ÷ Volume.

NOVEMBER/DECEMBER 1989

Page 10: "Calling All Toy Testers!"
How far can a Monster Wheeler go? How long can a Spinmaster spin? Have students graph the test results of their home-made toys to see how design changes affect performance. (See the Test Result chart on page 15 of *SuperScience*.)

Page 26: "Think Fast!"
How fast does your brain react? Students measure their reaction time using our "Brainmeter" ruler. Then they graph the results in a bar graph.

JANUARY 1990

Page 8: "Antarctica!"
How does the polar desert of Antarctica compare to "hot" deserts—the Sahara, the Gobi, the Mojave? Have students graph the average temperatures, precipitation, and other climate data for the world's biggest deserts.

Page 14: "10¢ Science: Can You Keep the Heat?"
Make a line graph to compare temperature changes in objects over time. (See pages 7 and 8 of the Teacher's Edition for reproducible data forms.)

Wallchart: "SuperThermometer"
What's hot—and what's not? Make bar graphs to compare the melting, freezing, and boiling points of objects.

FEBRUARY 1990

Page 13 and Wallchart: "Chart Your Heart!"
Compare students' pulse rates on a bar graph. Then use *Super-Science Graphs and Charts* to explore variables that affect pulse rate (time of day, boys versus girls, age, height, weight, and so on).

Page 14: "10¢ Science: Gravity"
Make bar graphs to compare how fast various objects fall.

Pages 4 and 31: "Take the *SuperScience* Taste Test!"
How many students are "tasters" and "non-tasters"? A simple taste test using a salt substitute reveals whether students taste more bitterness in certain foods (the "tasters") or more saltiness (the "non-tasters"). Make a pie graph of your results to see if your data matches that of the top "taste" scientists in the country!

Equipment Needed

For Apple IIe, IIc, and IIGS computers:

- One Apple IIe, IIc, or IIGS computer (128K or greater)
- One disk drive (a second disk drive is recommended)
- A color or monochrome monitor
- A printer (optional)
- The *SuperScience Graphs and Charts* program disk

MS-DOS computers:

- An IBM PC, PCjr, TANDY 1000, or a 100% IBM-compatible computer with at least 256K of memory and a color graphics card
- One disk drive (a second disk drive is recommended)
- A color monitor (or a monochrome monitor with a CGA graphics emulation card)
- A printer (optional)
- A DOS disk (version 2.0 or higher)
- The *SuperScience Graphs and Charts* program disk

Making a Legal Copy of the *SuperScience Graphs and Charts* Disk

The disk included in *SuperScience Graphs and Charts* is an Archival disk. Follow the instructions below for making a Legal Copy of *SuperScience Graphs and Charts*.

For a complete description of your rights and responsibilities in copying disks and using the program, see the Scholastic Software License and Warranty Agreement included in the *SuperScience Graphs and Charts* package. Scholastic also encourages schools to read, discuss, and distribute copies of the Educator's Guide to Software Copyright Policies and Ethics, included in this package.

The disk in this package is fully protected by copyright law. It is against the law to copy or in any way duplicate the disks or any portion of the program except under the terms expressly stated in these instructions and in Scholastic's Software License and Warranty Agreement.

You must make a Legal Copy of the Archival disk. You may not use the Archival disk for running the program. Use the Legal Copy instead.

To make a Legal Copy of the Archival disk, follow these instructions:

1. Use any standard copy program or function to copy the entire contents of the Archival disk onto one blank disk.

   NOTE: Be sure to copy the complete contents of the disk. Do not change any directory or file names.

2. Your package includes a Legal Copy disk label. Use a soft-tipped marker to write the serial number from the enclosed Software License and Warranty Agreement in the space on the disk label.

3. Affix the Legal Copy label to the copy that you created in step 1.

4. Store the Archival disk in a safe place with a copy of the Software License and Warranty Agreement.

If the Legal Copy becomes damaged or defective, first try recopying the program from the Archival disk to the Legal Copy itself. If the program still does not work, the Legal Copy disk medium itself may be defective. In this case, copy the program from the Archival disk to another disk as a temporary Legal Copy. Then send the defective Legal Copy disk to Scholastic at the address below for a free replacement. When you receive the replacement, erase the temporary

placement. When you receive the replacement, erase the temporary Legal Copy that you made.

If an Archival disk is damaged or defective, send it to Scholastic at the following address for a free replacement.

Scholastic Software
Scholastic Inc.
P.O. Box 7502
2391 E. McCarty St.
Jefferson City, MO. 65102

In Canada:
Software from Scholastic
123 Newkirk Road
Richmond Hill, Ontario
Canada L4C 3GS

Special Equipment Information

One Disk Drive

The instructions and activities presume you are using the 5.25-inch version of *SuperScience Graphs and Charts* with two disk drives. If you are working with one disk drive, you will have to switch disks to save and load your data. The program will notify you when you need to switch disks, so keep an eye out for these instructions on the screen.

Using a Tandy Computer

The *SuperScience Graphs and Charts* program asks you whether or not to tell your printer when to issue a linefeed. Some older versions of Tandy computers also instruct the printer to issue linefeeds automatically and, as a result, your printouts may have unwanted linefeeds. If your printouts have an extra linefeed (you'll notice it at once), try other IBM printer settings in the Printer Set Up menu (accessible from the UTILITY MENU). If this still doesn't work, you'll have to follow these special loading instructions each time you load the *SuperScience Graphs and Charts* into your Tandy:

1. Load Tandy DOS into your computer.

2. When the A> prompt appears, remove your Tandy DOS disk from Drive A and replace it with the *SuperScience Graphs and Charts* disk. Then insert your Tandy disk in Drive B.

   NOTE: If you are using a one-drive system, watch the screen for messages instructing you when to switch disks.

3. Type **Tandy** and press Enter.

4. When the A> prompt reappears, type **SSGAC** and press enter.

5. Remove the Tandy disk from Drive B.

Using a Hard Drive

You can install *SuperScience Graphs and Charts* on your hard drive. You are only permitted to install the program on one hard drive. If you want to install the program on multiple hard drives, you must buy multiple packages of *SuperScience Graphs and Charts*. To install the program on a network file server, you must obtain a network license for the stand-alone version.

How to Load *SuperScience Graphs and Charts*

Apple

1. Insert side 1 of your *SuperScience Graphs and Charts* program disk into Drive A.

2. Make sure your monitor is on.

3. Turn on your computer or press Control, Open Apple, and Reset at the same time.

4. The program will ask you to insert side 2 of the disk in Drive 1 and press Return.

5. You will then be asked to insert side 1 of the disk in Drive 1 and press Return.

6. When *SuperScience Graphs and Charts* has finished loading, you will see the title screen and then the MAIN MENU. Now you're ready to begin making your own tables, graphs, and charts.

NOTE: You will need a formatted data disk to save the tables, graphs, and charts you create. You will be able to format a disk using the Utility function listed on the MAIN MENU.

MS-DOS

You will need your DOS disk each time you load the *SuperScience Graphs and Charts* program into the computer. Make sure that it is DOS 2.0 or higher. Follow the instructions below to load *SuperScience Graphs and Charts.*

NOTE: You cannot install DOS on the SuperScience Graphs and Charts *program disk.*

1. Make sure your computer is turned off.

2. Turn on your monitor.

3. Insert the DOS disk in Drive A.

4. Turn on the computer. You'll be asked to enter the date and time. Press Enter twice to skip these requests, or type the date and time, pressing Enter after each entry.

5. When the A> prompt appears on your screen, you are ready to remove your DOS disk from Drive A and insert your *SuperScience Graphs and Charts* program disk.

   NOTE: Remember that you are only permitted to use a Legal Copy to load the program.

6. Type **SSGAC** and press Enter.

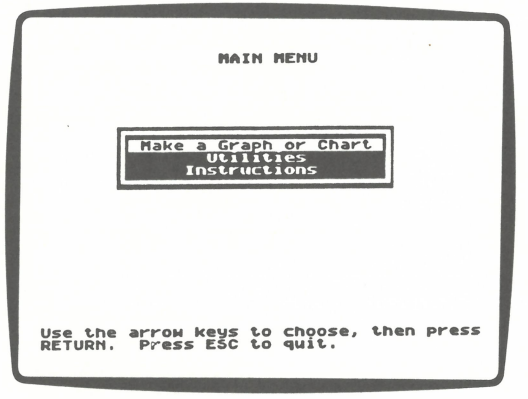
7. When *SuperScience Graphs and Charts* has finished loading, you will see the title screen and then the MAIN MENU. Now you're ready to begin making your own tables, graphs, and charts.

NOTE: You will need a formatted data disk to save the tables, graphs, and charts you create. You will need to create this formatted disk before you load SuperScience Graphs and Charts.

HOW TO USE *SUPERSCIENCE GRAPHS AND CHARTS*

The MAIN MENU

You will see the MAIN MENU when *SuperScience Graphs and Charts* finishes loading.

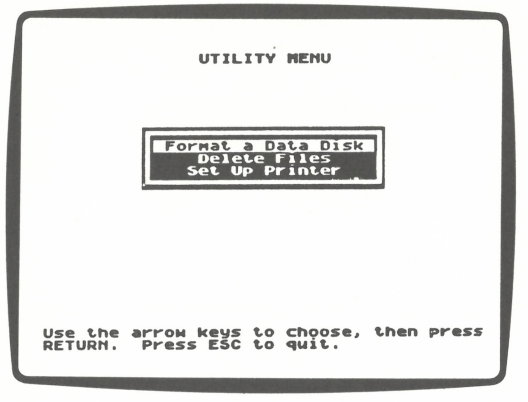


Instructions

Choose this option to read instructions on how to use *SuperScience Graphs and Charts.*

Utilities

Choose this option to see the UTILITY MENU.


UTILITY MENU
Format a Data Disk
Delete Files
Set Up Printer
Use the arrow keys to choose, then press RETURN. Press ESC to quit.

The UTILITY MENU

Format a Data Disk

If you are using an Apple computer, you may choose "Format a Data Disk" to prepare a disk to save your graphs and charts. (If you are using an IBM or other MS-DOS computer, you must first format your own data disk before using *SuperScience Graphs and Charts*. You can use your DOS disk to do so.)

Delete Files

Choose "Delete Files" to delete a data file from your data disk.

Set Up Printer

Choose "Set Up Printer" to tell *SuperScience Graphs and Charts* about your printer.

Printer: Choose this option to tell *SuperScience Graphs and Charts* the kind of printer you have. Use the Arrow keys to select a printer.

Interface Card: Choose this option to select a printer interface card. Use the Arrow keys to select an interface card.

Linefeeds: Choose this option to turn the linefeed option on or off. *SuperScience Graphs and Charts* assumes that you want the Linefeed option turned on. Use the Arrow keys to select On or Off.

Slot: If you have an Apple computer, choose this option to tell *SuperScience Graphs and Charts* which slot holds your printer interface card.

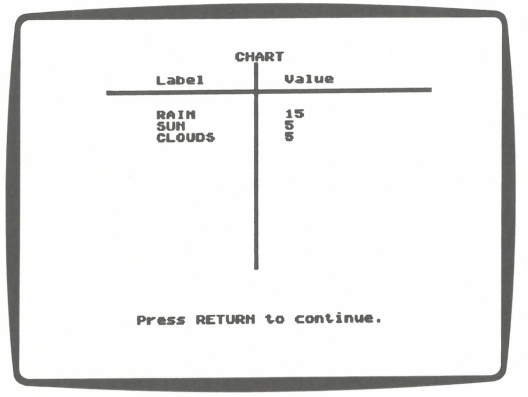
Done: Choose this option when you are finished to return to the MAIN MENU.

MAKE A GRAPH OR CHART MENU

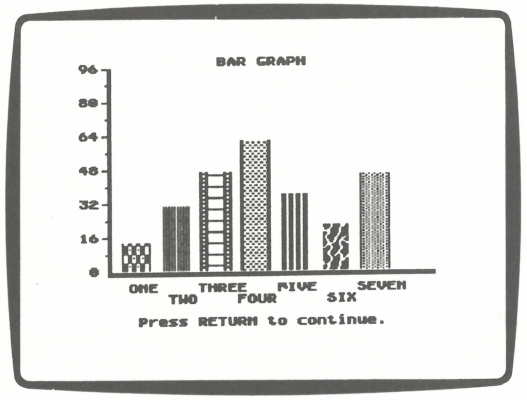
Choose this option on the MAIN MENU to make a table, graph, or chart. You may choose to "Make a Table," "Make a Bar Graph," "Make a Line Graph," "Make a Pictograph," or to "Make a Pie Chart." You may also load an existing data file from your data disk by selecting "Load a Data File."

Overview of Options

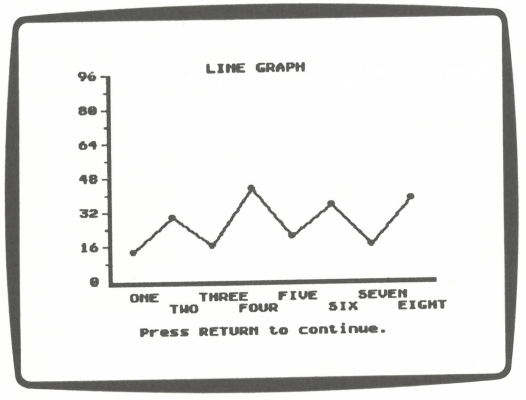
In a table, each piece of data is displayed in words and numbers. The name of each piece of data is under the column called "Label." The value of the label is on the same line as the label, under the column called "Value." You can see the value of a piece of data by reading across one line on the table. For example, next to the label called "Rain," the value is 15.



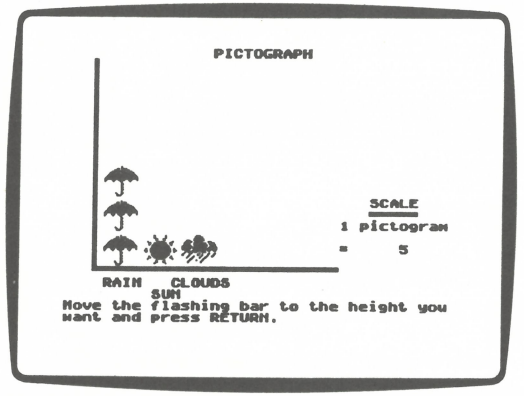
In a bar graph, each piece of data is displayed in a bar. The values (or numbers) the bar may be equal to are listed on the left side of the graph. You can see the value of each bar by its height. For example, in the bar graph below, the bar in column "ONE" is almost as high as the number 16. Therefore, the value of the column "ONE" is 15.



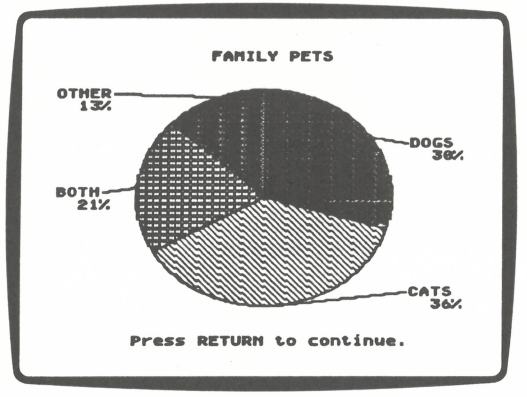
In a line graph, each piece of data is displayed as a dot. The dots for each piece of data are connected by a line. The values (or numbers) the dots may be equal to are listed on the left side of the graph. You can see the value of each dot by its height. For example, in the line graph below, the dot over the column "ONE" is almost as high as the number 16. Therefore, the value of the column "ONE" is 15.



In a pictograph, each piece of data is displayed in pictograms (graphics). Each pictogram has a value. For example, one pictogram may equal five. To figure out the value of an entire column of pictograms, count the number of pictograms in the column. Then multiply that number by the value of each pictogram you chose for the scale. For example, if one pictogram equals five, and there are three pictograms in the column, then the value of the column is 15.



In a pie chart, each piece of data is displayed as a percentage of a whole. The percentages themselves are represented graphically as sections or sectors of a circle (as in pieces of a pie). The values (or numbers) represented by each section of the pie chart cannot be read from the chart itself - only the percentages of the whole are displayed. For example, the section labeled "DOGS" is 30% of the whole. Therefore, it makes up 30% of the whole pie chart.



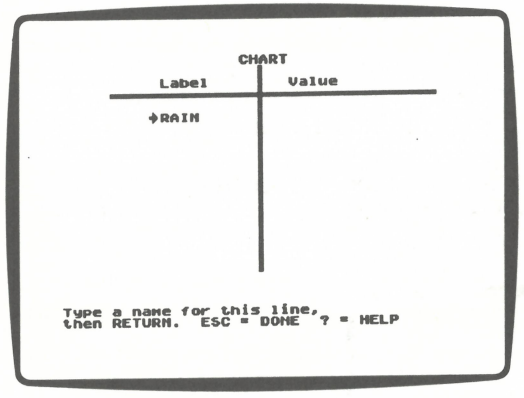
It will be up to you to decide whether any particular set of data can be represented in a pie chart. There are two important requirements to consider before making a pie chart: 1. Each item being graphed should appear in no more than one section. 2. All the items being graphed should cover all of the possibilities for some meaningful whole.

Making a Table

To make a table, look for the blinking arrow on the screen. You will first see the arrow at the top of your screen.

- Type a name for your table. Then press Return or Enter. The name may be up to 30 characters long. If you make a mistake typing, use the Delete key or the Left Arrow key to erase.

- Type a label, then press Return or Enter. For example, if you were to make a table of last month's weather, the first label would be "Rain" for rainy days.



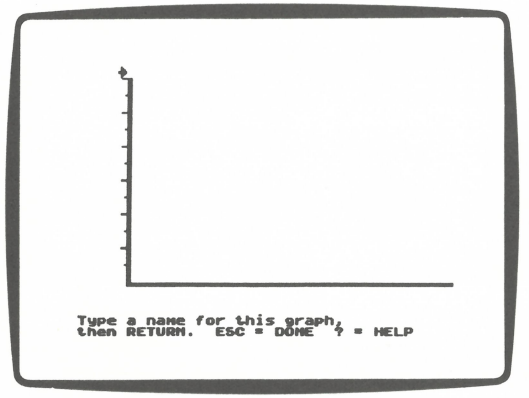
- Type a value (number), and press Return or Enter. For example, for the label "Rain," you would type the value "15" if there were 15 rainy days in the month.

You may have up to eight labels in your table.

Press Esc when you have finished making your table.

Making a Bar Graph, Line Graph, or Pictograph

To make a bar graph, line graph, or pictograph, look for the blinking arrow on the screen. You will type information for your graph next to the arrow. You will first see the arrow at the top of the screen.



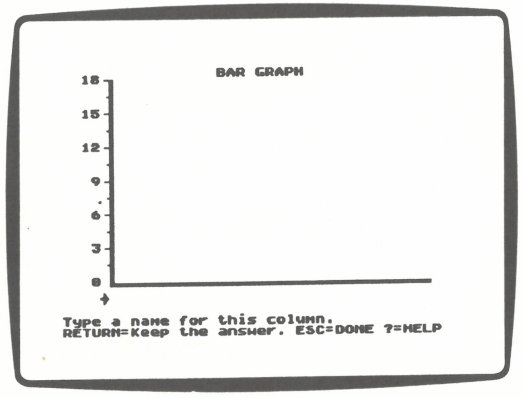
- Type a name for your graph, then press Return or Enter. The name may be up to 30 characters long. If you make a mistake typing, use the Delete key or the Left Arrow key to erase.

- Type a name for the value of the scale in your graph. For example, if you make a graph of last month's weather, the values equal the days in the month. The name of the scale may be up to seven characters long. If you make a mistake typing, use the Delete key or the Left Arrow key to erase.

- To make a bar graph or line graph, type the largest value (number) in your graph, then press Return or Enter. For example, if you make a graph of last month's weather, and it was rainy on 15 days, cloudy on five days, and sunny on five days, you know the largest number in your graph is 15.

SuperScience Graphs and Charts will automatically fill in the numbers between zero and the largest number in your graph.

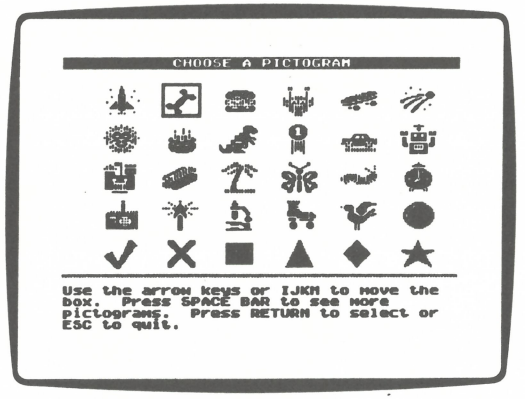
NOTE: The scale will always be a multiple of six. If the largest number in your graph is not divisible by six, SuperScience Graphs and Charts *will automatically change the scale.*



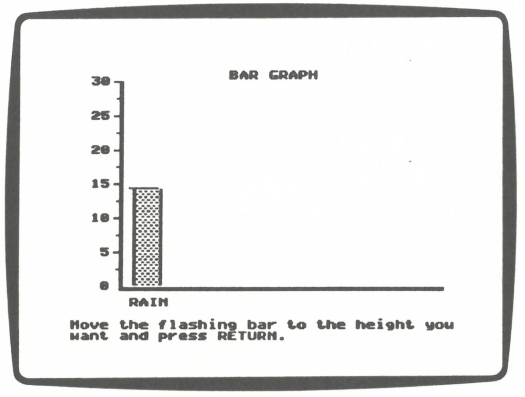
- To make a pictograph, type the value for one pictogram. For example, in the graph of last month's weather, you may want one pictogram to equal five days.

- Type a name for the first column in your graph, then press Return or Enter. The name may be up to seven characters long. If you make a mistake typing, use the Delete key or the Left Arrow key to erase.

- If you make a pictograph or bar graph, *SuperScience Graphs and Charts* will next ask you to select a pictogram or bar to use in that column. You may choose from 90 pictograms and ten bars. Use the Arrow keys to move the highlight box over the pictogram or bar you want to use, then press Return or Enter.


CHOOSE A PICTOGRAM
Use the arrow keys or IJKM to move the box. Press SPACE BAR to see more pictograms. Press RETURN to select or ESC to quit.

- Move the pictogram, bar, or dot to the height you want, then press Return or Enter. For example, if the column represents the number of rainy days in a month, move the pictogram, bar, or dot up to 15.



You may make up to eight columns in a bar graph or line graph, and six columns in a pictograph.

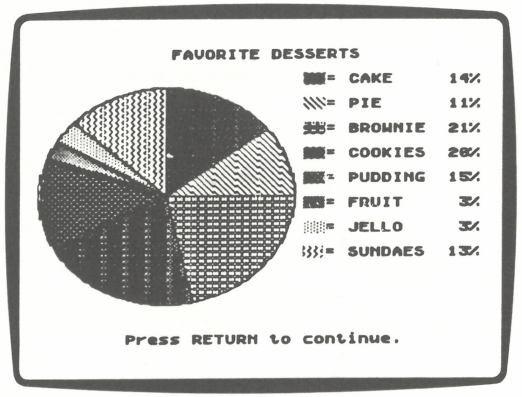
Press Esc when you have finished making your graph.

Making a Pie Chart

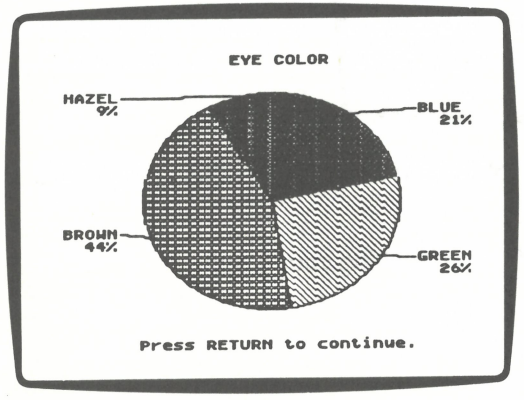
You may make a pie chart with legends or labels.

If you choose to use a legend, a portion of the pattern used to fill each section of the pie chart will be displayed in the top right corner of the screen. Each pattern will be followed by an equal sign and the name and percentage value of the section filled with that pattern.

If you choose labels, the name for each section will appear near the section itself and will be connected to that section with a straight line.



WITH A LEGEND



WITH LABELS

- Type a name for your Pie Chart, then press Return or Enter. The name you choose may be up to 30 characters long. If you make a mistake typing, use the Delete key or theLeft Arrow key.

- Use the Arrow keys to define each section of the pie chart. In the lower right corner of the screen, you can see the percentage of the whole that your section represents changing as you move the dividing line. Press Return or Enter when you are done.

- Type a name for your section. The name may be up to seven characters long. If you make a mistake typing, use the Delete key or the Left Arrow key to erase.

You may make as many as eight sections in your pie chart.

Press Esc when you have finished making your pie chart.

The WHAT DO YOU WANT TO DO NOW? MENU

When you are done making a table, graph, or chart, you will see the "What Do You Want To Do Now?" MENU. You may select to "See Your Graph," "Print Your Graph," "Edit Your Graph," "Convert Your Graph," "Save Your Data," or "Make a New Graph or Chart."

- Choose "See Your Graph" to see your finished table, graph, or pie chart.

- Choose "Print Your Graph" to print your graph.

  NOTE: If you haven't yet told SuperScience Graphs and Charts *about your printer, you will be instructed to do so now.*

- Choose "Edit Your Graph" to edit any part of your table, graph or pie chart. The blinking arrow will appear at the top of the screen. Make any changes you want, then press Return or Enter to go on. Press Esc when you are done editing.

- Choose "Convert Your Graph" to convert or change your graph into another type of table, graph, or chart. For example, if you make a table, you may convert it into a bar graph, line graph, pictograph, or pie chart. You may convert your graph into as many types of graphs as you want.

  NOTE: If you first make a pie chart and then convert it into another graph or a table, SuperScience Graphs and Charts *will ask you the total number of things represented by your pie chart. (Remember, pie charts only show percentages, not actual values.) Type a number, then press Return or Enter to see your pie chart.*

- Choose "Save Your Data" to save your data on your data disk. *SuperScience Graphs and Charts* will ask you to type a name for your file.

- Choose "Make a New Graph or Chart" to make a new table, graph, or chart. *SuperScience Graphs and Charts* will first remind you that this will erase the table, graph, or chart you have already made.

ACTIVITIES

Laterality— The Science of Left and Right

Laterality refers to right-left dominance or preferences in behavior. People have right-left preferences not just for writing and throwing, but for many actions, and for many body parts. Although "right" preferences are more common, practically no one favors the same side exclusively.

Scientists do not fully understand the causes of right-left preferences or why, in particular, right-side preferences are so common. As biologist Desmond Morris once put it, this question constitutes "... one of the minor mysteries of human life." By analyzing the results of simple observations, your class will find a curious scientific puzzle right before their eyes (and arms, and hands, and legs ...).

Activity 1: Which Hand Do You Use?

Observe handedness in different actions and parts of your body. Gather and graph class data to draw conclusions about patterns of handedness.

MATERIALS:
- Paper and pencils for each student to record data.
- "My Preferred Hand" chart (see chart on page 26)

BACKGROUND:
Roughly nine out of ten school age children throughout the world exhibit some form of right-hand dominance, so "right" answers to the questions below will probably predominate over "left" answers in your class. But each child is likely to find that his or her preferred hand is not always the same one and that the terms "right-handed" and "left-handed" are oversimplifications.

DIRECTIONS:
1. Raise the topic of handedness with your class. How many students know their right hand from their left hand? In what sports and other activities is handedness important? Ask your students how they decide if they are right or left-handed. Do right-handed (left-handed) people always prefer to use their right (left) hand? Is there only one test for handedness or are there many?

2. Have each student create a data sheet for hand preferences. After you ask each question, students should check "left," "right," or "both" on their data sheet. Encourage them to test their non-preferred hand for these behaviors. (This is both fun and helpful if they are not sure which hand is preferred.) If a student remains unsure of a preference, he or she can choose "both."

QUESTIONS:

1. Which hand do you write with?

2. Which hand do you throw a ball with?

3. Ask your students to close their eyes. Have them imagine they have an itch exactly in the middle of their back. Then have them pretend to scratch the itch. Which hand do you scratch with?

4. Have your students stand up and hold their hands behind their back (the "at ease" position). Which hand holds the other?

5. Ask your students to clap their hands, as if they were applauding for you. Which hand claps faster, or harder, or into the other?

6. Ask students to clasp their hands together. Notice that the thumb of one hand crosses over the thumb of the other. Which hand's thumb is "on top?"

7. Ask students to pretend to thread a needle. Which hand guides the thread?

Your students' data sheets should look something like this: (Students' responses will vary.)

MY PREFERRED HAND

Behavior	Right	Left	Both
Write	x		
Throw	x		
Scratch			x
Back		x	
Clap		x	
Clasp		x	
Thread	x		

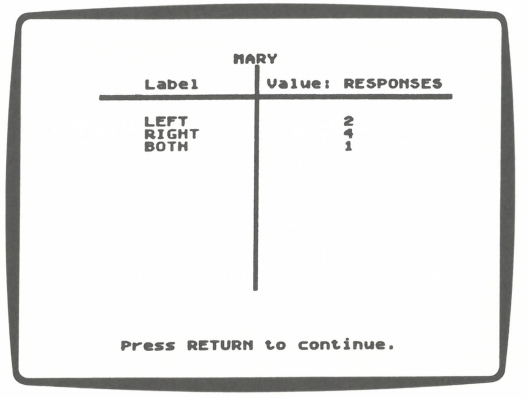
WRAP-UP:

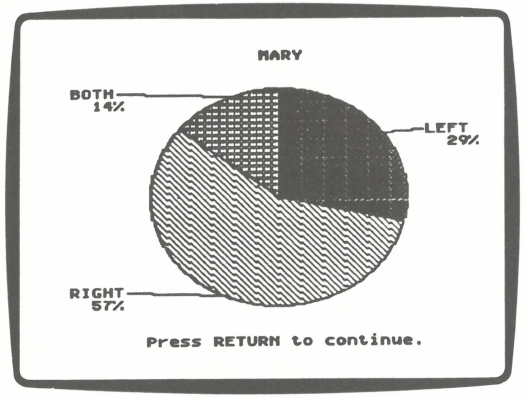
Use *SuperScience Graphs and Charts* to interpret your results. Discuss with your class appropriate ways to represent their results. As always, this will depend on the nature of their data and the specific question they wish to answer.

Here are two possibilities:

A. Students can create a TABLE for themselves showing the number of times they checked "Right," "Left," and "Both." This TABLE can be converted into a PICTOGRAPH or a BAR GRAPH, and from either of those, into a PIE CHART. Confirm with your class that the requirements for a PIE CHART are met. (Each of their responses was either "right," "left," or "both." No response could be more than one of these categories.) If students wish, they can add the category, "other" for any other imaginable cases. Students may print out charts or graphs to compare among themselves.

A typical student's data could look like this:

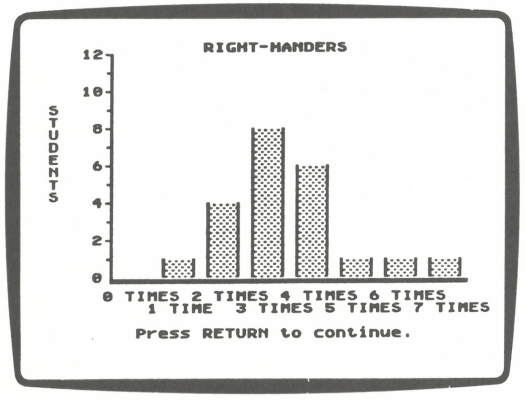




Some questions to ask: Who had the greatest percentage of "both" responses? How about "left" and "right?" Did anyone have nearly equal percentages of "left" and "right" responses?

B. Create a BAR GRAPH for the entire class showing how many students answered "right" 0 times, 1 time, 2 times, ... 7 times. Discuss with the class what top value to assign to the graph. (Possibilities: the number of students in the class; the highest value in the data.)

The BAR GRAPH may look like this:



Some questions to ask: Did anyone answer "right" to every question? Did anyone answer "right" to no question? What was the most frequent number of "right" answers?

FURTHER EXPLORATION:
How would you classify the behaviors you have been testing? Some require strength (throwing a ball), some only require coordination (scratching back), some involve two hands (clasping hands behind back), while others only involve one hand (writing). Create TABLES and PIE CHARTS for each behavior showing the numbers (or percentages) of students answering "right," "left," or "both" for each behavior. Do you notice any patterns in the results?

ACTIVITY 2: ARMS, LEGS, AND HEAD

OBJECTIVE:
Observe laterality in different parts of the body. Gather and graph class data to draw conclusions about patterns of laterality.

MATERIALS:
- Paper and pencils for each student to record data
- "My Preferred Side" chart (see chart on page 30)

BACKGROUND:
We can find instances of laterality in a surprisingly wide range of behaviors. Does anyone think of himself or herself as "left-shouldered?" As with handedness, individual variability within a general bias toward right dominance is the norm.

DIRECTIONS:
Continue the survey of individual preferences as described in ACTIVITY 1. Again, encourage students to test both sides to experience the strength of their preferences.

1. Stand up and pretend to kick a ball. Which foot do you kick with?

2. Cross one leg over the other while seated. Which leg is crossed over the other?

3. Cross your arms in front of your chest. Which arm is crossed over the other?

4. Wink one eye. Which one is easiest to wink?

5. Pretend you are cradling a baby in your arms. To which side do you hold the baby's head? (most people hold the baby's head on the left side of their body, over the heart.)

6. Tilt your head over on one shoulder as far as you can. Which shoulder do you tilt most easily towards?

Your students' data sheets should look something like this: (Students' responses will vary.)

LEFT AND RIGHT

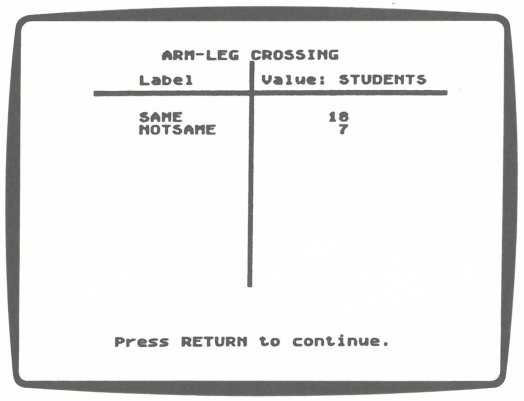
Behavior	Right	Left	Both
Kick	x		
Leg cross	x		
Arm cross			x
Wink		x	
Cradle		x	
Tilt		x	

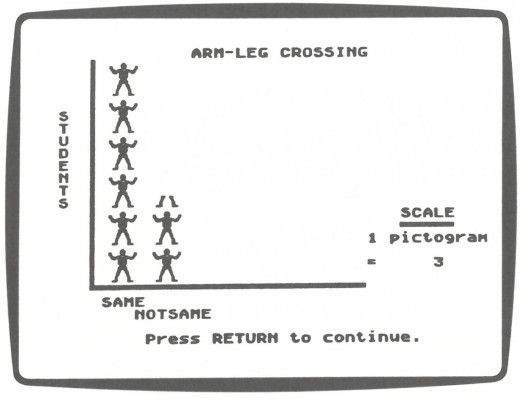
WRAP-UP:
Use *SuperScience Graphs and Charts* to analyze your results. Discuss with your class which types of graphs will be appropriate.

Here are two possibilities:

A. Students can count and record class totals for each action. They can create TABLES and then PIE CHARTS for each action showing the percentage of "left," "right," and "both" preferences in the class. For which behavior is the class most alike? most different?

B. Create a TABLE for the class showing whether "arm crossing" and "leg crossing" appear to be associated. Count and record the number of students who answered the same way for questions 2 and 3. Then count and record the number of students who answered a different way for questions 2 and 3. Convert this table into a PICTOGRAPH or BAR GRAPH.





FURTHER EXPLORATION:
Discuss the need to collect data from more people in order to be confident about conclusions. Students can collect data from other classes or their families. Have students try to identify additional examples of left-right asymmetries in people's behavior.

ACTIVITY 3: EYE DOMINANCE

OBJECTIVE:
Observe laterality in our visual system. Gather and graph class data to draw conclusions about patterns in eye dominance.

MATERIALS:
- Paper and pencils for each student to record data.
- Student's data sheet (see chart on page 33)

BACKGROUND:
Our visual system usually exhibits a left-right bias of its own. Most people have one eye which is dominant over the other. Visual dominance is determined by siting an object with your thumb, while keeping both eyes open. If your thumb appears to jump when viewed with only one eye open, the closed eye is your dominant eye. If your thumb "jumps" when either eye is closed, neither eye is dominant. That is called mixed-dominance.

DIRECTIONS:

1. Let students work with partners. Have one student perform the investigation, while the other guides the activity and records data. Then have them switch roles.

a. Have each team choose an object in the front of the room that they can see easily (the clock, the flag, a picture).

b. One student extends his or her arm in front his or her face. The hand is formed into a fist with the thumb extended upwards about in line with the nose. With both eyes open, the student positions the thumb so that it appears aligned as much as possible with the chosen object in the front of the class. Students with glasses should leave them on.

The guiding student should remind his or her partner to keep looking at the object even if it is hidden behind the thumb.

c. Without moving, the student closes one eye and reports whether the thumb appears to have changed position. The partner notes which eye was open and whether the thumb appeared to move.

d. Repeat step c. with the other eye closed. Remember to hold your position as much as possible. The recording partner notes which eye is open and whether the thumb appeared to move.

e. Both partners examine the data to decide which eye, if either, is dominant.

A student's data sheet could look like this (students' responses may vary):

NAME _____	**PARTNER** _____
OPENED EYE	DID THUMB JUMP?
RIGHT	*NO*
LEFT	*YES*
DOMINANT EYE	*RIGHT*

2. Partners now switch roles.

WRAP-UP:
Discuss with students the appropriate way to represent the data for the class. Create a TABLE like this:

EYE DOMINANCE	
LEFT	*YOUR CLASS DATA*
RIGHT	*YOUR CLASS DATA*
MIXED	*YOUR CLASS DATA*

Because the data falls into discrete categories, a PIE CHART is suitable for displaying the percentage of students who are left, right, or mixed eye dominant.

FURTHER EXPLORATION:
Do we have dominant ears? Help students to plan an experiment to determine if we can locate a sound better with one ear alone than another. (One possibility: Students sit in circle. One closes eyes and covers one ear. One of the students in the circle rings a bell. The "subject" must point to where he or she thinks the sound came from. Note by how many students he or she is off: "0" means the correct student was indicated; "1" means he or she was 1 student away, etc. Does one ear receive a lower, or better, score for locating the source of the sound?)

Keeping Our Balance

Most animals have the good sense to get around on four legs. Human beings are one of a very few animals that walk on two legs. This peculiar style of locomotion (called bipedalism) is potentially very unstable. A few simple exercises will illustrate how much we depend on our muscles and senses to keep our balance.

ACTIVITY 1: OUR ARMS AND EYES HELP US WALK

OBJECTIVE:
Investigate how arms and vision help us to maintain balance when we move. Gather, chart, and graph class data. Predict the activities in which it will be more difficult to maintain one's balance.

MATERIALS:
- Masking tape.
- Yard or meter stick.
- Paper and pencils for recording data.
- "How Well I Balance" chart (see chart on the next page)

BACKGROUND:
Swinging our arms in rhythm with our gait is an important and automatic method we use to keep from falling. Many other muscles in our legs and torso must function in unison to prevent us from toppling over when one foot leaves the ground. We also rely heavily on visual information about our orientation and speed of motion.

DIRECTIONS:
1. Raise the topic of balance with your class. In what sports and activities is balance especially important?

2. Make a straight line about 15 feet long in your classroom with masking tape. (If you have linoleum tiles or other patterns in your flooring, you might be able to dispense with the tape by defining a line along a seam or any other clear feature.)

3. Let students work in groups. One student from each group sees how far along the line he or she can walk without stepping off the line under the limiting conditions described below. Use a measuring stick or the natural features of the floor to determine the distance. The other students in the group can measure and record the distance. A student may request another try at each activity and take the best distance of the two tries. Then let the group rotate roles.

   a. "NORMAL" : the way that feels most natural for you.
   b. "ROPE" : one foot placed immediately ahead of the other (as if on a tightrope).
   c. "X" : arms held crossed over chest.
   d. "SIDES": arms held fixed at sides.
   e. "CLOSED" : normally but with your eyes closed.
   f. "X-CLOSED" : with your arms crossed and eyes closed.

A sample data chart follows:

EXERCISE	DISTANCE
Normal	___
Rope	___
X	___
Sides	___
Closed	___
X-Closed	___

WRAP-UP:
Discuss with students how to best represent the data they have collected. Have students use *SuperScience Graphs and Charts* to create a TABLE showing the distance they achieved for each exercise. They can convert their TABLE into a PICTOGRAPH or BAR GRAPH.

Can students agree on which activity was easiest and which was most difficult? Based on their data, ask students to list the exercises beginning with the easiest and ending with the most difficult.

If students were to gather additional data from more people, do they think that the "easiest to hardest" list would look the same? How might it change? (The expected order of difficulty for the activities listed above might be: 1 (easiest)-NORMAL, 2/3-X or SIDES; 4-ROPE; 5-CLOSED; 6- X-CLOSED.

FURTHER EXPLORATION:
Invite another class or other students to try this activity and to test your students' predictions.

Let your students invent new exercises to test their walking balance.

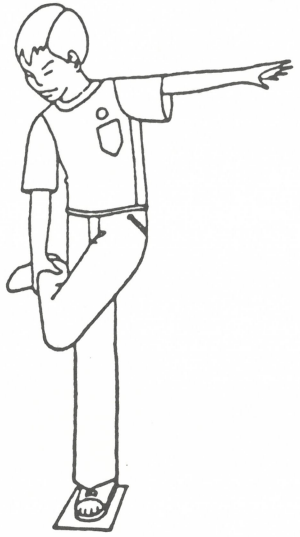
ACTIVITY 2: MUSCLE STRENGTH AND STANDING BALANCE

OBJECTIVE:
Observe the effect of muscle strength on balance when standing still. Gather and graph data to analyze and compare the performances of the students' stronger and weaker legs.

MATERIALS:
- Paper and pencils to record data
- Watch with second hand (one for each group)
- "Right-Left Balance" chart (see chart on next page)

BACKGROUND:
Even when we aren't moving, simply standing erect poses a balancing problem. We use our muscles continuously to correct for tiny amounts of swaying, not to mention an occasional gust of wind. Our non-preferred leg is generally our weaker leg and is often much less stable than our preferred leg. Either leg, when its muscles are fatigued, will eventually become too tired to keep us stable.

DIRECTIONS:
1. The exercise in this activity is to stand on one leg and use your same side hand to hold your other foot in front of you. You can use your free arm to balance.



The object of the exercise is to see how long you can stay in that position without putting down your other foot and without hopping around. Students can compare their performance on each leg. (Make sure there is enough space to try this activity safely. Some children will have trouble with this and others may hop about trying to keep their position.)

2. Have students work in groups. Each group has a watch with a second hand. The students in a group take turns performing the one-leg balance test. A student can get into the balancing position using another group member for support. When the timer in the groups says "now", the balancer lets go. Another student can record the resulting time. If a balancing time exceeds 70 seconds, that trial can be ended and given a score of 70. A student can request a second chance for either leg and take the best result.

A sample data collection chart follows:

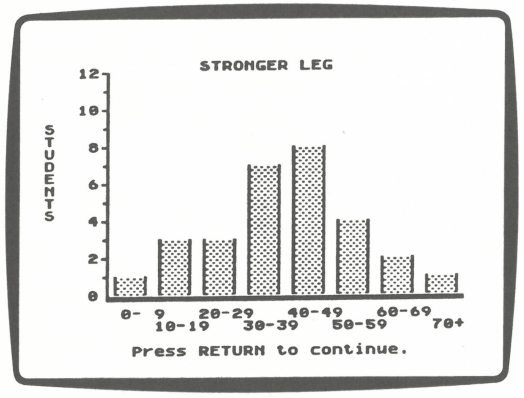
NAME	TIME STANDING ON LEFT FOOT	TIME STANDING ON RIGHT FOOT
	_____	_____
	_____	_____
	_____	_____

WRAP-UP:
Use *SuperScience Graphs and Charts* to analyze the results of this exercise. Discuss with your students the best way to compare the performance of their stronger and weaker legs.

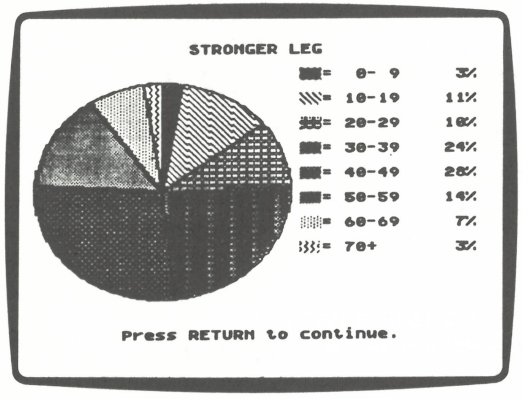
Here are two possibilities:

A. Have students focus first on the leg for which they recorded their best time. Make a class BAR GRAPH showing the number of students whose scores fell into the following intervals: 0-9 seconds, 10-19 seconds, 20-29 seconds, 30-39 seconds, 40-49 seconds, 50-59 seconds, 60-69 seconds, 70+ seconds. This GRAPH can be converted into a PIE CHART to show the percentages of students whose scores fell into the intervals listed above.

POSSIBLE BAR GRAPH



CORRESPONDING PIE CHART



Do the same using the data collected for the weaker leg.

These graphs can be printed out and compared in order to draw inferences and interpret data.

Ask these questions about both the stronger and the weaker leg:

- What was the highest interval attained by anyone in the class?

- During what interval did the greatest number of students stop balancing? (The interval with the greatest value).

NOTE: This data can be displayed in a bar graph.

- By which interval had half of the class already lost their balance? (Add the values in each interval starting at either end of the graph. The interval in which you reach or surpass half the class is the answer. Or for PIE CHARTS, the sector in which the cumulative percentage passes or reaches 50% is the answer.)

B. Have each student calculate the balancing time difference for his or her two legs. Create a BAR GRAPH or PICTOGRAPH showing the number of students who found a difference of 0-9 seconds, 10-19 seconds, 20-29 seconds, 30-39 seconds, 40-49 seconds, 50-59 seconds, 60-69 seconds,70+ seconds.

FURTHER EXPLORATION:
Ask your class to predict what results they would expect if their legs were tired. Help them to devise an experiment to test their predictions. Possible ways for students to tire their leg muscles: hop in place, perform jumping jacks, run up several flights of stairs. Then repeat the directions in this activity.

Heart Rate and Exercise

Your heart is a muscle about the size of your fist. Everyone's heart contracts and relaxes about 100,000 times every day. Each contraction of the heart pushes blood through the vast network of veins and arteries in the body.

You can detect the contractions of your heart by feeling your pulse. What you feel is a rhythmic bulging of your arteries (a vessel that carries blood away from the heart) as blood courses through them. The bulge is a result of your heart's contraction. There is one bulge, or pulse, for every complete heart beat. Pulse rates are measured in pulses, or beats, per minute.

Our pulse rate depends on a great many factors including: age, weight, level of fitness, and whether you are exercising or resting.

ACTIVITY 1: RESTING PULSE

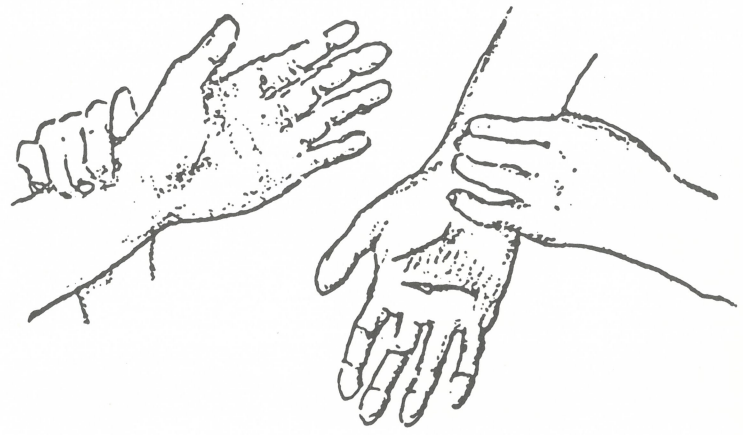
OBJECTIVE:
Use numbers to measure pulse rate and compare resting pulse rates. Gather and graph data to compare variations in one's own and others' resting pulse rates.

MATERIALS:
- A watch or clock with second hand.
- Paper and pencils to record data.
- "My Resting Pulse Rate" Chart (see chart on page 42)

BACKGROUND:
Your resting pulse is the rate at which your heart beats when you are not engaged in any particular activity. It is a baseline you can use for comparison when you study how your heart responds to exercise. There are in fact several resting pulses one could measure: sitting, standing, and lying down. Average resting pulse rates for adults are about 70 beats/minute. Your students' resting pulse rates will probably be higher.

DIRECTIONS:
1. Explain that even when we are not "doing anything," our heart is still working to pump blood. Also explain that we can feel a surge of blood in many vessels of our body whenever the heart beats. That means our pulse is an indicator of how fast our heart is beating.

Illustrate the proper technique for detecting one's own pulse and a partner's pulse. The best place to feel the pulse is where a large artery lies close to the surface of the body. The radial artery near the edge of the wrist on the thumb side gives a strong pulse in most people. Use the tips of your fingers when feeling for a pulse and press just hard enough to make the pulse clearly detectable.



Students may also find a pulse at the temple, the side of the throat, or on top of their foot. If they measure a pulse at the throat or temple, make sure they press on only ONE SIDE to avoid cutting off blood to the brain.

2. Students should work in pairs — a counter and a subject. When you say "READY," the counter feels for the pulse in his or her partner. Ten seconds later, you say "BEGIN" and the counter begins silently counting pulses. Fifteen seconds later, you say "STOP" and the counting stops and the result is recorded.

When measurements are completed, the results should be multiplied by 4 to estimate the number of pulses or heart beats per minute. For example,

18 pulses counted in 15 seconds
X4
72 pulses in one minute

Let your students practice taking each other's pulse using this procedure.

3. When everyone's pulse has been detected and everyone has had a chance to take a pulse, have the class sit quietly for one minute. Lead student teams in taking four pulse rate measurements, resting one minute between each measurement. A sample schedule for data collection follows:

   11:00:00 "READY" (Counter finds partner's pulse.)
   11:00:10 "BEGIN" (Counter begins counting pulses.)
   11:00:25 "STOP" (Counter stops counting and records number. Conversion to pulses per minute done later.) (partners sit quietly and prepare to switch roles.)
   11:01:00 "READY" (Counter finds partner's pulse.)
   11:01:10 "BEGIN" (Counter begins counting pulses.)
   11:01:25 "STOP" (Counter stops counting and records number. Conversion to pulses per minute done later.)
   11:02:00 "READY" (Next cycle begins.)

   After each student has taken four pulse measurements, students can convert their own data into pulses per minute. A student's data sheet may look like this:

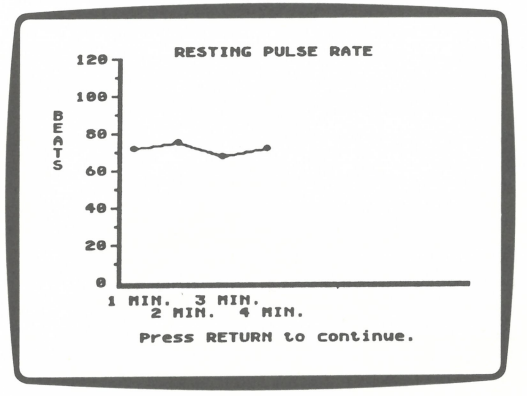
Name _____	**Partner** _____
beats in 15 seconds	beats in one minute
18	X 4 = *72*
19	X 4 = *76*
17	X 4 = *68*
18	X 4 = *72*

WRAP-UP:
Discuss appropriate ways to represent the data using *SuperScience Graphs and Charts.*

Two possibilities:

A. Have each student create a LINE GRAPH showing resting pulse rate over time (4 minutes). Choose a maximum value of 120 so that all the graphs will be easy to compare. The labels for the X-axis can be "1 min.", "2 min.", "3 min.", and "4 min." Students can print out and then compare their LINE GRAPHS.

A LINE GRAPH for the example above would look something like this:



Lead your class in a discussion about the variation students observe in their own resting pulse rate. It could be the result of counting mistakes or evidence that their hearts aren't beating at exactly the same rhythm even over a few minutes (both are likely). Introduce the idea of an average as a good method for finding the number to best summarize their individual results. Have each student calculate his or her average resting pulse rate for this exercise.

B. Use the students' average pulse rates to create a BAR GRAPH of pulse rates for the class. Set the maximum value of the Y axis to the number of students in your class. Label the X axis values: "-55" , "56-65", "66-75", "76-85","86-95", "96-105", "106-115", "116-"

What is the range of resting pulse rates in the class? What is the most frequent value (or interval) for resting pulse in the class?

FURTHER EXPLORATION:

A. Assume that your heart always beats at the resting pulse rate you measured for yourself. How many times will your heart beat in a day? a year? 50 years?

B. What might account for differences in resting pulse rates between people? Your class might want to compare the pulse rates of boys and girls, for example. A good project would be to collect and compare data on resting pulse rates from other groups (adults, younger siblings, smokers).

C. Repeat this activity to investigate resting pulse rates for standing and lying down.

ACTIVITY 2: EXERCISE AND PULSE RATE

OBJECTIVE:
Investigate the effect of exercise on pulse rate. Gather and graph class data. Predict and compare pulse rate changes after different exercises.

MATERIALS:
- A watch or clock with second hand
- Paper and pencils to record data
- "My Active Pulse Rate" chart (see chart on page45)

BACKGROUND:
When we exercise, our body's increased need for oxygen and the removal of wastes causes our hearts to beat faster so that more blood can reach our cells. Precisely how much faster our heart beats depends on many factors, but everyone's pulse increases when they exercise.

DIRECTIONS:

1. Divide the classroom into three stations. A different exercise will be performed at each station. Explain the procedure to be followed to your class. Ask your students to predict which exercise(s) will increase students' pulse rates the most dramatically.

2. Students at each station can again work in pairs. A student will record four resting pulses for his or her partner in a row, listening to your signals to get ready, begin, and stop (see page 42, preceding ACTIVITY). Then the student whose pulse is being measured will perform the exercise at that station for 30 seconds (or as long as possible).

The exercises are: jumping jacks, running in place, and walking (around the station).

NOTE: Use common sense when undertaking exercises which require heavy exertion. Advise your students to use common sense as well. Students should not exert themselves to the point of pain or dizziness. This activity is not a contest among students but a study of how each individual's heart responds to an increased demand.

After exercising, the student's pulse is recorded once more by his or her partner on your signal.

Next, the partners switch roles and repeat this procedure.

3. Students then can convert their measurements into beats per minute. A typical data sheet may look like this:

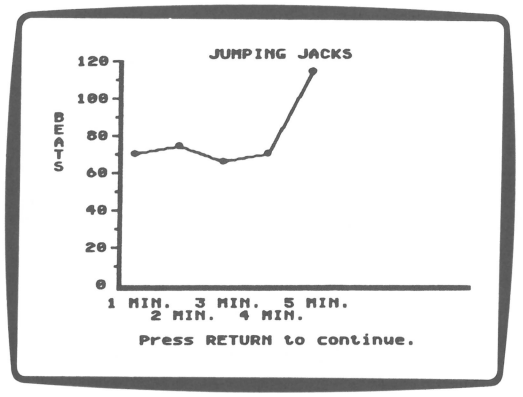
Name _____

PULSES IN 15 SECONDS	PULSES IN ONE MINUTE
18	X 4 = 72
19	X 4 = 76
17	X 4 = 68
18	X 4 = 72
jumping jacks *29*	X 4 =116
running in place ___	x 4 = _____
walking _____	x 4 = _____

NOTE: Student will complete the chart for the exercise being conducted at his/her station only.

WRAP-UP:
Use *SuperScience Graphs and Charts* to help interpret your data. Discuss with your class the possible ways to represent their results.

Each student can make a LINE GRAPH or PICTOGRAPH showing how his or her pulse rate changed after exercise. Set the maximum value to 120 (or the maximum value among all that were recorded). The X-axis labels can be "1", "2", "3", "4", and "5." Students can print their graphs to compare with each other's. An example from the data above would look like this:



Did everyone's pulse rate increase after exercise? Whose pulse was the highest? Which exercise(s) seemed to increase pulse rates the most?

FURTHER EXPLORATION:
Ask your students to predict what they would have found if they had kept recording their pulse after they had stopped exercising. They (or a few) can recreate this activity and then make four additional pulse measurements, each at one minute intervals in order to test the prediction. (Pulse rates will eventually return to the resting rate. This is called *pulse recovery*. The speed of recovery depends in part — and is an indicator of — an individual's fitness.) Have students record this data and chart it on a line graph.

HOW FIT IS YOUR CLASS?: THE SCIENCE OF HEALTH AND PERFORMANCE

This is a special section to get your class thinking about how to assess their own fitness. The concept of physical fitness comprises many dimensions including endurance, strength, and flexibility. Here are three standard activities to assess each of these aspects of fitness along with suggested minimal standards for "fit" performance*. You can choose any of these exercises for your class. The emphasis here is not on competition — but rather on learning about oneself. Each student can "win" by meeting his or her personal standard for fitness.

The interpretation of any one or even a few specific measurements is never clear-cut, but comparing oneself to standards is a good way to begin to think about and take responsibility for one's own health. Obviously, handicapped children or those with special circumstances require different standards of performance. Several applied and pure scientific disciplines focus on how to best improve fitness and performance. Sports and exercise physiologists, nutritionists, and athletic equipment designers are a few examples.

OBJECTIVE:
To have students assess their own fitness and carry out a plan to improve it.Process Skills: data gathering, data recording, charting/graphing.

Credits:
* Presented in, FITNESSGRAM, Institute for Aerobics Research, Dallas Texas. 1987

Exercises

A. Flexibility: The "Sit and Reach"

MATERIALS:
- A wooden or sturdy cardboard box about 12 inches high.
- A ruler.

SET UP:
A student assumes the starting position by removing his/her shoes and sitting on the floor so that the knees are fully extended (legs stretched out) and shoulder width apart. The bottoms of the feet are placed flat against the box. A ruler is placed on the box by the students' toes so that 9 inches extends over the edge of the box toward the student. The "zero" end of the ruler is nearest the student.

PROCEDURE:
The arms are extended one on top of the other with palms down over the measuring rule. The student may reach directly forward along the scale four times. On the fourth reach, the student must hold the position for one second. A spotter will record the most distant point reached to the nearest 1/2 inch.

- make sure the student's knees remain extended.
- students can begin again if they reach out unevenly or flex their knees.

NOTE: The accepted minimum standard for fitness for boys and girls ages 5-15+ years is 10 inches.

B. Strength: The Sit-Up

MATERIALS:

- Mats or some other comfortable surface is recommended
- A stopwatch or watch with second hand

SET UP:
The student lies on his/her back with knees bent and the soles of the feet flat on the floor. The heels are placed about 15 inches from the buttocks. The arms should be crossed on the chest with the hands on opposite shoulders. During the test, the feet are held in contact with the testing surface by a partner. By contracting his/her abdominal muscles, the student curls into the sitting position. A sit-up is completed when the elbows touch the thighs. Arm contact with the chest must be maintained and the chin must be tucked forward on the chest. The student returns toward the starting position after completing each sit-up until the mid-back makes contact with the testing surface.

PROCEDURE:
The student attempts to complete as many sit-ups as possible in a 60 second trial.

Here are the minimal standards for fitness for sit-ups:

AGE	5	6	7	8	9	10	11	12	13	14	15	16	16+
BOYS	20	20	20	25	25	30	30	35	35	40	40	40	40
GIRLS	20	20	20	25	25	30	30	30	30	35	35	35	35

C. Endurance: One Mile Run/Walk

MATERIALS/FACILITIES:

- A flat running course for running one mile.
- A stopwatch or watch with second hand for each timer.

PROCEDURE:
Students are instructed to complete the course as fast as possible. Scores for the one mile run/walk should be in minutes and rounded to the nearest second. A score of zero is given if a student does not finish. Students should be reminded before the trial to pace themselves and to attempt to keep a constant pace throughout. Walking is permitted, but the object is to cover the distance in the shortest possible time.

NOTE: Avoid trials on days of high humidity and temperature.

Here are the minimal standard times for acceptable levels of fitness (in minutes and seconds):

AGE	BOYS	GIRLS
5	16:00	17:00
6	15:00	16:00
7	14:00	15:00
8	13:00	14:00
9	12:00	13:00
10	11:00	12:00
11	11:00	12:00
12	10:00	12:00
13	9:30	11:30
14	8:30	10:30
15	8:30	10:30
16	8:30	10:30
16+	8:30	10:30

DIRECTIONS:

1. Discuss the concept of standards with your class. Cite examples, such as passing a first-aid or life-guard test, or passing a physical examination to be allowed on a sports team. Lead a discussion about underlying criteria for fitness based on what the class has studied so far (endurance was involved in the pulse and exercise activity, strength was involved in the one-leg balance, flexibility was involved in some of the balance and left-right preferences work). Point out that specific handicaps must also be taken into account.

2. Introduce the fitness tests of this section and decide with your students which ones to use.

3. For each exercise, students can then determine whether they met the criterion for fitness.

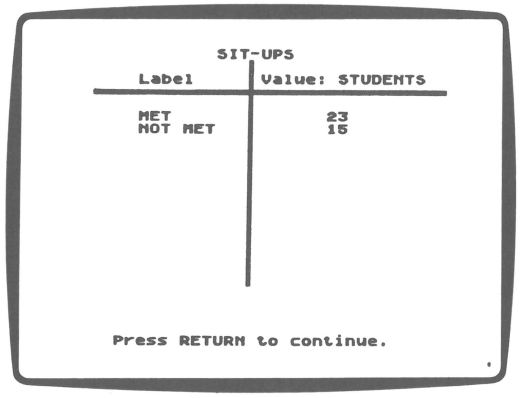
4. Have students record their performance in a simple chart such as the one below. By adding more columns on the right, this chart can be extended to include data collected at different times.

NAME _____ DATE _____

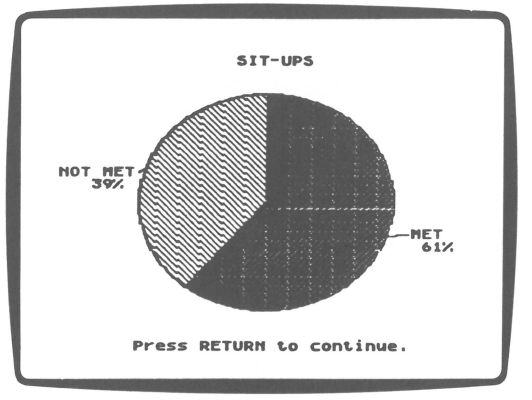
EXERCISE	HOW I DID
Sit and Reach	_____
Sit ups	_____
One Mile Walk/Run	_____

WRAP-UP:
Create PICTOGRAPHS, BAR GRAPHS or TABLES for each exercise illustrating how many individuals successfully met the standards for that exercise. These can be converted into PIE CHARTS and printed out.

Example:
TABLE



PIE CHART



Which exercise did most people do best at in terms of meeting the standards?

Which was the most difficult for those who tried it to achieve the standard?

FURTHER EXPLORATION:
Students can define a performance goal they would like to achieve in any of these exercises and devise a training program to help themselves meet these goals. They should consult a physical education instructor or athletics coach for help in making their plan. After a few weeks or months, they can test themselves again and evaluate their success.

APPENDIX (APPLE)

This Appendix contains supplementary printer information. Refer to the sections that apply to you.

Special Printer Notes

If you have problems printing with *SuperScience Graphs and Charts* or find discrepancies in how your printer equipment works with the program, refer to the items below.

Printers and Interfaces Missing From Current Setup Lists

If your printer or interface card is not on the Printer or Interface Card list, check the instructions that came with your equipment to see if it is compatible with another printer or interface on the list. If it is, select the compatible printer or interface card for your Printer Setup.

FingerPrint+ Parallel and Grappler+ Interface Owners

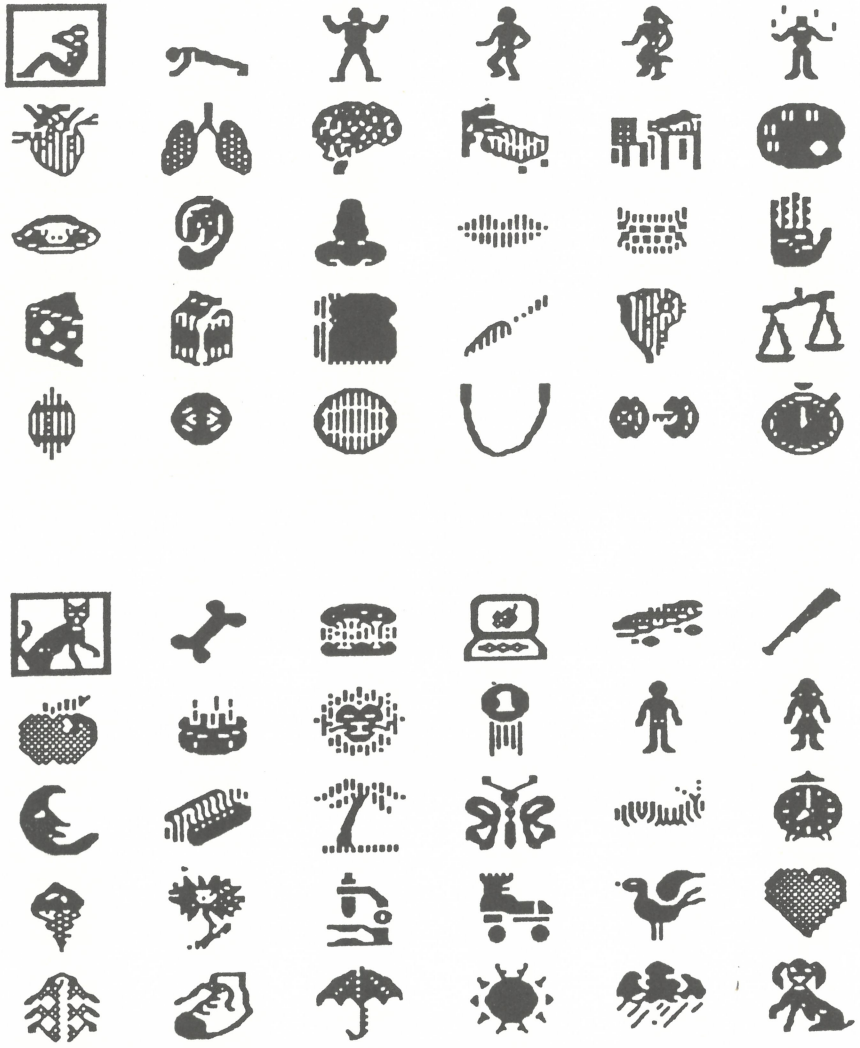
If you are using an Epson printer with a FingerPrint+ parallel or Grappler+ interface and are experiencing difficulty printing, try selecting the Grappler+ Alt(ernate) or the Fingerprint+ Parallel Alt(ernate) from the interface list.

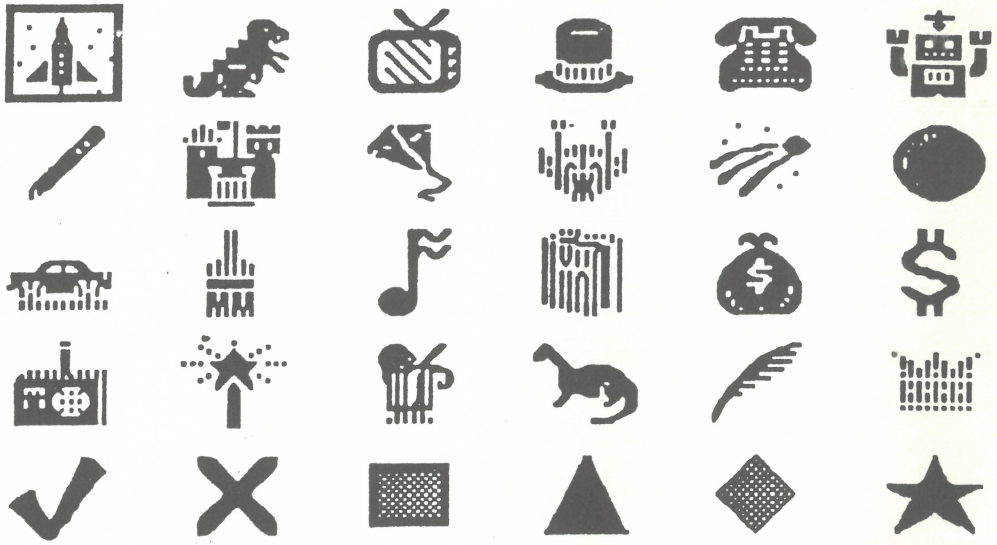
Linefeed Setting

If your printer prints your entire *SuperScience Graphs and Charts* design on one line or skips every other line, you need to change the linefeed setting. To do this, select Linefeed from the Setup Menu. If it prints on one line, turn the linefeed setting On. If it prints with blank lines, turn the linefeed setting Off.

PICTOGRAMS

There are 90 pictograms from which you may choose when making a pictograph.





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